

CLAIMS

1. An exhaust gas recirculation device comprising:
an exhaust gas recirculation passage of an engine;
an EGR cooler provided within this exhaust gas
recirculation passage;

a bypass passage connected between the upstream side and
the downstream side of said EGR cooler provided within said
exhaust gas recirculation passage;

an EGR valve provided within said exhaust gas
recirculation passage on the downstream side of said EGR cooler;
and

a bypass valve for opening and closing said bypass passage,
and further comprising a valve controlling means that has a
function determining the timing period of flowing the
high-temperature exhaust gas diverted from said EGR cooler into
said EGR valve, and that controls in switching operation the
bypass valve such that during said timing period, the
high-temperature exhaust gas is not passed through the EGR
cooler, but flown into said EGR valve through said bypass
passage, and except during said timing period, the
high-temperature exhaust gas is passed through said EGR cooler
to be circulated.

2. An exhaust gas recirculation device according to Claim
1, wherein the bypass valve is provided at the connection
between the exhaust gas recirculation passage and the bypass

passage in between the EGR cooler and the EGR valve placed on the downstream side of the EGR cooler, and the bypass valve is controlled and alternatively switched by the valve controlling means to the following: a valve position in which the bypass passage is intercepted and the EGR cooler is connected to the EGR valve; a valve position in which the path between said EGR cooler and said EGR valve is intercepted and the bypass passage and said EGR valve are connected to each other; or a valve position in which on the downstream side of said EGR cooler the EGR cooler and said bypass passage are each connected to said EGR valve in the predetermined opening degrees of the valve.

3. An exhaust gas recirculation device according to Claim 1, wherein when detecting means of deposit adhesion information located in the exhaust gas recirculation passage on the downstream side of the EGR cooler is judged that the amount of the recirculation of the exhaust gas is reduced in comparison with an opening degree of the EGR valve, the valve controlling means is adapted to take the judged time as the timing period, and control in switching the bypass valve to flow the high-temperature exhaust gas into the EGR valve.

4. An exhaust gas recirculation device according to Claim 1, wherein the valve controlling means has an exhaust-gas-temperature controlling function for controlling the temperature of the exhaust gas to be flown into the EGR valve within the range of a set temperature.

5. An exhaust gas recirculation device according to Claim 1, wherein a time for flowing the high-temperature exhaust gas is set only during a time range such that the bypass valve and EGR valve are not thermally affected in the timing period.

6. An exhaust gas recirculation device according to Claim 1, wherein the valve controlling means is adapted to drive the EGR valve on or after circulation of the high-temperature exhaust gas.